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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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Decai Sun

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06/15/2004

FAY, SHARPE, FAGAN, MINNICH & McKEE, LLP
Seventh Floor
1100 Superior Avenue
Cleveland, OH 44114-2518

EXAMINER

BAUMEISTER, BRADLEY W

ART UNIT

PAPER NUMBER

2815

DATE MAILED: 06/15/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/924,840	SUN ET AL.	
	Examiner	Art Unit	
	B. William Baumeister	2815	

-- *Th MAILING DATE of this communication appears on the cov r sheet with the correspondence address --*

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 22 March 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-18 is/are pending in the application.
- 4a) Of the above claim(s) 3,4,8-15,17 and 18 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1,2,5-7 and 16 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date <u>8/8/01</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Election/Restrictions

1. Applicant's election with traverse of invention I in the reply filed on 3/22/2004 is acknowledged. The traversal is on the ground(s) that the reasons set forth in the restriction requirement do not meet the test for combination subcombination restrictions. This is not found persuasive.

a. Applicant argues that the explanation of the a-Si(Ge) compositions is not believed to be relevant and requests additional understanding and description of this explanation.

Claim 1 sets forth an emitter/detector: a subcombination "Bbr." Claim 7 further sets forth the specific Si(Ge) compositions for this subcombination, and therefore constitutes "Bsp." Claims 3 and 4 set forth the emitter/detector of claim 1 ("Bbr) in combination with various lenses, thereby constituting the combination "A1Bbr." Similarly, claims 8-15 additionally set forth anti-reflection layers, thereby constituting the combination "A2Bbr." Restated, the SiGe composition limitation of claim 7 is relevant because it sets forth a Bsp subcombination claim which is a prerequisite for restricting the broad and specific subcombination claims from the combination claims. See MPEP 806.05(c).

b. Applicant argues that "emitter/detector" and "generator/monitor" are merely different words meaning the same thing.

The examiner agrees. The difference in words was not the basis of showing that the subcombinations were separately usable. Rather it was the fact the emitter/detector device (or "generator/monitor device") could be used alone

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without the inclusion of any of the additional combination elements, A1-A3, set forth in the combination claims.

The requirement is still deemed proper and is therefore made FINAL. Applicant is invited to call the examiner if questions still remain about the present restriction or about combination/subcombination restriction practice in general.

Claim Rejections - 35 USC § 112

2. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

3. Claims 16 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

a. While the first recitation of the phrase "such as" (relating to the first electrode) was amended by preliminary amendment, the remaining presence of the second recitation of the phrase "such as" (relating to the second electrode) still renders the claim indefinite because it is unclear whether the limitations following the phrase are part of the claimed invention. See MPEP § 2173.05(d).

- i. The examiner provisionally interprets the second recitation to have been intended to be changed as well, but correction is required for confirmation.

Claim Rejections - 35 USC § 102

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

5. Claims 1, 2, 6 are rejected under 35 U.S.C. 102(b) as being anticipated by Jiang et al. '630.

a. Jiang discloses VCSELs 115/215 (e.g., FIGs. 1 / 2) that emits in the range of about 650 nm – 850 nm (col. 4, lines 38-40). A pin photodetector 102 that absorbs part of the emitted light is formed on top of the VCSEL. The pin-diode layers may be composed of any suitable materials, with specific examples including silicon, hydrogenated silicon and amorphous H:Si(Ge) (col. 4, lines 6-44).

b. Regarding claim 2, the VCSEL's upper DBR 116, upon which the pin-diode is configured, reads on the claimed semitransparent substrate.

c. Regarding claim 6, the p and n regions of the diode, being implicitly heavily doped in order to function as intended, read on the first and second transparent/conductive electrode layers, and the I region reads on the active sensor element.

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6. Claim 5 is rejected under 35 U.S.C. 102(e) as being anticipated by Wagner et al. '599.

A VCSEL emits at 850 nm or at 1330-1350 nm (col. 8, lines 35-38). See e.g., FIGs 34 and 35 wherein a VCSEL is formed in aperture 3407; a pin photodiode 3401 is mounted on a flexible transparent substrate 3402 (col. 21, line 55-); the photodiode and transparent substrate are flip-chip mounted to the VCSEL substrate (col. 22, lines 20-).

Claim Rejections - 35 USC § 103

7. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

8. Claim 7 is rejected under 35 U.S.C. 103(a) as being unpatentable over Jiang et al. '630 as applied to the claims above.

a. Claim 7 further requires that the active sensor element include p-I-n layers. As such, Jiang's p and n layers cannot also read both the p/n layers of the active sensor and also read on the transparent/conductive electrodes set forth in claim 6. As such, claim 7 is not anticipated.

b. Nonetheless, it was well known to those of ordinary skill in the art at the time of the invention to employ various transparent/conductive oxides, such ITO and zinc oxide, in light emitters and detectors for making electrical contact to the optical device and for better spreading the current across the diode's surface(s). It would have been obvious to

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one of ordinary skill in the art at the time of the invention to have additionally employed one of the recited transparent/conductive layers on the top and/or bottom surfaces of Jiang's pin diode for this conventional purpose of increasing lateral current spreading from the non-transparent conductors 130/134.

9. Claim 16 is rejected under 35 U.S.C. 103(a) as being unpatentable over Jiang '630 as applied to the claims above, and further in view of Applicant's admitted prior art.

a. Jiang teaches that it was known to provide semitransparent detectors/sensors that absorb part of the light emitted at least from emitters such as VCSELS. Jiang does not appear to disclose that the emitter may emit wavelengths within the range of 1.1 - 1.7 microns, as set forth by claim 16.

b. Applicant admits that emitters emitting within this wavelength range were conventional, and that it was known to provide detectors that sense light emitted from these emitters (e.g., specification , page 5, lines 5-7).

c. It would have been obvious to one of ordinary skill in the art at the time of the invention to have provided—in the manner set forth by Jiang—a detector for sensing light in the wavelength range of 1.1-1.7 microns, since applicant emitters that such emitters were conventional, and because Jiang teaches that the photodetector may be composed of any suitable material (col. 4, lines 6-).

Conclusion

10. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

- a. Lebbby et al. '703 teaches PD 48/ mounted on VCSELs 46' (e.g., FIG 5 wherein either the VCSEL's upper DBR, or alternatively the underfill 61, may be viewed as reading on the PD semitransparent substrate), and expressly incorporates by reference, various other patents including the Jiang '630 patent cited previously within this Office Action hereinabove).
- b. Aronson et al. '862 teaches detectors integrated on emitters.
- c. Minemier et al. '158 teaches emitter and detector chips that are flip-chip connected.
- d. Spaeth et al. '559 teaches a light emitter flip-chip bonded to a light receiver chip.

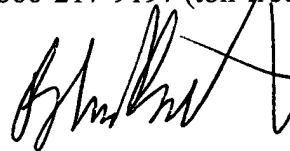
Contact Information

Any inquiry concerning this communication or earlier communications from the examiner should be directed to B. William Baumeister whose telephone number is (571) 272-1722. The examiner can normally be reached on M-F 8-5.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Tom Thomas can be reached on (571) 272-1664. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



BRADLEY BAUMEISTER
PRIMARY EXAMINER

B. William Baumeister
Primary Examiner
Art Unit 2815

June 12, 2004